

SOME ADVANCES IN THE EXPLANATION OF ENTREPRENEURIAL INTENTIONS

Marco van Gelderen, Massey University

Maryse Brand, University of Groningen

Mirjam van Praag, University of Amsterdam

Wynand Bodewes, Erasmus University Rotterdam

Erik Poutsma, University of Nijmegen

Anita van Gils, University of Maastricht



CONTACT: Marco van Gelderen, Massey University, Auckland Campus, College of Business, Department of Management and International Business, Private Bag 102904, NSMC, Auckland, New Zealand. Tel: 64 9 4140800 ext 9338, Email: m.vangelderen@massey.ac.nz

ABSTRACT

This paper provides a detailed explanation of entrepreneurial intentions and interest among business students. We employ the Theory of Planned Behaviour (TPB), which regards intentions as resulting from attitude, perceived behavioural control, and subjective norms. Our main study is replicated among four samples of undergraduate students of business administration (total N=1225). The results show that the two variables that most consistently explain entrepreneurial interest and intentions are sensitivity to business opportunities (entrepreneurial alertness) and the importance attached to financial security.

INTRODUCTION

The explanation of entrepreneurial intentions is an area in entrepreneurship research where a sizeable body of comparable studies has emerged. With some exceptions (e.g., Davidsson, 1995; Raijman, 2001; Wilson, Marlino and Kickul, 2004) the population under investigation concerns (business) students, sometimes current, sometimes alumni. Although convenience considerations may play a role, it also makes sense to study business students as they are a very important group of customers of entrepreneurship education. In order to serve their needs well it is important to know what determines their career choices and intentions.¹ In addition entrepreneurship education programs can be evaluated in terms of changes in the level or quality of entrepreneurial intentions (Peterman and Kennedy, 2003).

The purpose of this paper is to contribute to the existing literature on the explanation of entrepreneurial intentions by incorporating a number of features in our research design. Before we make a case for each of these features we provide a short overview of the research designs used thus far.

¹ In this paper we will discuss interest in and intentions of setting up one's own business in the future. The terms entrepreneurship, setting up a business, and self-employment will be used as synonyms.

RESEARCH DESIGNS FOR STUDYING ENTREPRENEURIAL INTENTIONS

Research efforts to gain this understanding can be guided by a variety of theoretical models. Several writers observe that in past research personality variables, demographics, personal history and social contexts were the primary influences to be considered when explaining entrepreneurial status choice (Scherer, Adams, Carley, and Wiebe, 1989; Katz, 1992; Kolvereid 1996a, b). Variables representing these influences figure in models that explain firm entry (Learned, 1992; Gibb Dyer Jr., 1994; Naffziger, Hornsby and Kuratko, 1994; Busenitz and Lau, 1996; Crant, 1996). Because these variables are distal explanations of entrepreneurial career preference, explanatory power turned out to be low. Low explanatory power means low predictive power, with limited possibilities for intervention as a consequence. In the nineties researchers started to use social psychological models involving more proximal variables. Variables within these models are domain-specific in terms of content (selected because they are related to entrepreneurship), and situation-specific in terms of measurement (measured in the context of entrepreneurship).

Thus far mainly attempts have been made to predict entrepreneurial intentions, not realisation of these intentions.² In most of the studies use was made of one of two models. The first one is Ajzen's (1988, 1991) Theory of Planned Behaviour (TPB), which explains entrepreneurial intentions by means of attitudes, perceived behavioural control and subjective norms. The other model is proposed by Shapero and Sokol (1982). The Shapero model explains entrepreneurial intentions from perceived desirability, perceived feasibility and propensity to act. Although Krueger, Reilly and Carsrud (2000) have conceived of these models as competing, the consensus has been that the two models overlap to a large degree. Shapero's perceived desirability is supposed to correspond to Ajzen's attitudes, and Shapero's perceived feasibility is supposed to correspond to Ajzen's perceived behavioural control (Krueger, 1993; Krueger and Brazael, 1994; Kolvereid, 1996b; Auttio, Keeley, Klostén, and Ulfstedt, 2001). In both models people must be willing and able to set up a business. Both the Ajzen model and the Shapero model have consistently received empirical support in research on entrepreneurial intentions of business students. In a direct comparison of the two models, Krueger, Reilly and Carsrud found both models to give satisfactory predictions (Shapero model adj. r sq. 0.41 ($p < 0.0001$) and TPB model adj. r sq. 0.35 ($p < 0.0001$)).

In this paper we will limit ourselves to the Theory of Planned Behaviour. This means that we will (a) not use the Shapero model and (b) disregard additional variables outside of the TPB that might explain entrepreneurial intentions. Concerning issue (a), our reasons for doing so are primarily related to the specification of the two models. Shapero and Sokol (1982, pp. 83) confusingly refer to desirability in terms of social norms, while operationalisations of propensity to act have confusingly been made in terms of control measures (Krueger, 1993). In comparison, theoretical specification of the TPB is more detailed and consistent. Much research has gone into testing, advancing and criticising the TPB. Concerning issue (b), the influence of additional variables, such as gender, work experience, parental role models, and personality traits, is assumed to be mediated by the components of the TPB in influencing entrepreneurial intentions. Whether the effects of these variables on entrepreneurial intentions are indeed only indirect is not the focus of this paper. By focusing on the best possible predictions and explanations using the TPB, we facilitate comparison with previous research.

² Meta-analyses show strong ability of intentions to predict actual behavior in other applied settings (Sutton, 1998; Armitage and Conner, 2001). However, to our knowledge no confirmation for entrepreneurial career choice has appeared in refereed journals.

RESEARCH DESIGN

The design of this study encompasses five features that we expect to be helpful in arriving at a detailed and valid explanation of entrepreneurial intentions. All of them have been used previously in research on entrepreneurial intentions, as Table 1 shows, but not simultaneously. One feature is to use a range of dependent variables ranging from non-committal ones to very specific behavioural expectancies. The arguments for using a range of dependent variables are given in the paragraph below. The subsequent paragraph lists the arguments for three features that concern the independent variables: to investigate the TPB components at the variable level making up the components; to derive the variables from the actual population studied; and to correct for association beliefs if necessary about the attributes of organisational employment versus self employment. The final feature is to employ a replication design using comparable samples. The obvious rationale for testing the robustness of findings is to ascertain how stable and reliable the results are. This design feature was employed in Davidsson's (1995) study, the results of which he also discusses in his methodology book (2004) when extolling the virtues of replication studies.

Table 1 Design features employed in this paper used by other studies

	SCV (att)	SCV (pcb)	VSDP	CAVO	URDV	RRSC
Krueger (1993); Krueger, Reilly, and Carsrud (2000)*; Peterman and Kennedy (2003)*	0	0	0	0	0	0
Davidsson (1995)	●	0	0	0	●	●
Kolvereid (1996a, b)*; Tkachev and Kolvereid (1999)*	●	0	●	●	0	0
Autio et al. (2001)*	0	0	0	0	0	●
Lee and Wong (2001)	n/a	n/a	0	0	●	0
Rajman (2001)	n/a	n/a	0	0	0	0
Douglas and Shepherd (2002)	●	n/a	0	0	0	0
Phan, Wong, and Wang (2002)	●	●	0	0	●	0
Luthje and Franke (2003)	0	n/a	0	0	0	0
Kristiansen and Indarti (2004)	0	0	0	0	0	0
Wilson, Marlino and Kickul (2004)	●	0	0	0	0	0

SCV = split components into variables; att = attitude component; pcb = perceived behavioural control; VSDP = variable selection derived from population; CAVO = check for association of the variables with the outcome (organisational versus self employment); URDV = report on a range of dependent variables; RRSC = replicate results in comparable samples; * = used Theory of Planned Behaviour; ● = design includes feature; 0 = not so.

DEPENDENT VARIABLE SELECTION

Intentions represent a person's motivation in the sense of her or his conscious plan or decision to exert effort to enact the behaviour (Conner and Armitage, 1998). However, quite some controversy has emerged in the social psychological literature about the measures of intentions that are being used (Warshaw and Davis, 1985; Bagozzi, 1992; Bagozzi and Kimmel, 1995; Armitage and Conner, 2001). Depending on the formulation, these measures have been labelled as desires (e.g., do you want to start a business), preferences (e.g., if you could choose between being self-employed and being employed by someone, what would you prefer), intentions (e.g., do you plan to start a business), and behavioural expectancies (e.g., estimate the probability you'll start your own business in the next five years). Use of a particular type of dependent measure

may affect the predictions and explanations that result. This discussion is especially relevant when studying entrepreneurial intentions among samples of undergraduate students. Some students might be undecided as to their career preference, while others do have goals that often change, thus suffering from goal instability (Multon, Heppner, and Lapan, 1995). In fact, in a review on career decidedness types, Gordon (1998) postulates seven different subtypes: very decided, somewhat decided, unstable decided, tentatively undecided, developmentally undecided, seriously undecided, and the chronically indecisive. Research on career anchors stipulates that people find their true work values only after a period of trial and error, and some work experience has been acquired (Schein, 1978, 1990, applied to entrepreneurship by Feldman and Bolino (2000) and by Lee and Wong (2004)). So when studying entrepreneurial aspirations among students it appears to be too strict to limit oneself to studying intentions in the strict sense: it is also relevant if students are interested in setting up a business, but currently do not yet have a clear intention to do so. This means that when doing research among undergraduate students it is apt to study non-committal measures (e.g., interest) as committed measures (e.g., behavioural expectancies). This begs the question whether students are the right population to test the model, as the TPB is devised to explain intentions, not interests. In order to find out we will assess the differential impact of a variety of dependent measures.

Apart from accommodating characteristics of the population which is studied, the use of different dependent measures is also relevant for theoretical reasons. It has been argued that behavioural expectancies should provide better predictions of behaviours than measures of interest (Warshaw and Davis, 1985), because behavioural expectancies include a consideration of the likely choice of other competing behaviours (Armitage and Conner, 2001; Silvia, 2001). Bagozzi (1992) has suggested that attitudes may first be translated into desires, which then develop into intentions to act, which direct action. Given that non-committal measures such as desires and interest take no account of facilitating/inhibiting factors, variable making up the PBC should be more closely associated with committed measures such as behavioural expectations. This is confirmed by empirical evidence (Bagozzi and Kimmel, 1995; Armitage and Conner, 2001). In conclusion, we will operationalize entrepreneurial intentions in several manners, and verify whether this results in different levels of importance of explanatory variables. We will use the term entrepreneurial intention as overarching construct in the remainder of this paper.

EXPLANATORY VARIABLE SELECTION AND HYPOTHESES

Attitude, perceived behavioural control (PBC), and subjective norms are assumed to determine intentions, which in turn determine behaviour. While some previous research provides data on the component level (e.g., the importance of attitude, perceived behavioural control, and social norms), it is very useful to establish results on the level of the variables that make up these components. Detailed knowledge of this kind is necessary for the design of interventions targeting entrepreneurial intentions. Care should be taken when selecting these variables. Attitude, PBC, and subjective norms are held to be determined by two components: beliefs about outcomes and evaluations of these outcomes. Pre-selection of relevant beliefs should be done carefully, as beliefs can be expected to vary among different populations. For example, younger people might perceive other factors than older people as being desirable or undesirable about self-employment. We recommend doing extensive pilot studies in order to capture the relevant beliefs for a particular population. It is customary in research using the TPB not to work with individual beliefs, but

rather with modal beliefs that are identified in pilot studies (Ajzen, 2002). Usually a frequency-of-elicitation procedure is used, with beliefs that have been mentioned most often being included in the major study. So outcomes, referents and inhibitory/facilitating factors are not assessed per individual but rather pre-selected. The use of modal beliefs has the advantage that the whole sample can be compared on similar variables. Applied to our research with students, this concerns the perceived attractive and the unattractive aspects of self-employment, as well as the believed factors that make starting or running a business feasible (referents of subjective norms can safely assumed to be spouse, family, friends and 'important others').

Pilot studies. Pilot studies were held among undergraduate students of business administration of the Free University of Amsterdam (n=200) and of the University of Amsterdam (n=173). Open questions were used to solicit outcome beliefs for attitude formation. Two questions were asked: (a) What aspects do you think are attractive about self employment; (b) What aspects do you think are unattractive about self employment. Open questions were also asked to solicit control beliefs: (a) What is needed to set up a business; (b) What is needed to successfully run a business.

Attitudinal variables in the model. Answers were content analysed and four outcomes showed the highest frequencies of occurrence: autonomy and challenge (attractive aspects), and financial insecurity and work load (unattractive aspects). Based on the student beliefs, we hypothesize the importance attached to autonomy and challenge to be positively related, and the importance attached to financial security and the avoidance of work load to be negatively related to interest in setting up a business. In addition, we decided to add the importance attached to money and wealth attainment as an additional variable, as perhaps students might mention this less often because of social desirability considerations (materialism is not well regarded by the Dutch although you would hardly guess that from their behaviour). Wealth in the context of self-employment refers to accumulated value of the firm as well as one's salary and benefits. When working for an organisation the amount of wealth that one can accumulate is relatively fixed, while in self employment the opportunities to acquire wealth are – at least theoretically – infinite.

Hypothesis 1: Students who attach higher importance to autonomy, challenge, and wealth attainment, and who attach lower importance to financial security and work load avoidance will take more interest in starting a business.

Perceived behavioural control variables in the model. The two questions on PBC beliefs were usually answered in an identical fashion. In the opinion of students, starting as well as successfully running a business primarily depends on perseverance and creativity. Based on the student beliefs, we hypothesise perseverance and creativity to be positively related to interest in setting up a business. In addition, we decided to add measures of entrepreneurial alertness and of self-efficacy. Entrepreneurial alertness (Kirzner, 1973; Gaglio and Katz, 2001) was added as business students may have overlooked that sensitivity for detecting business opportunities is a precondition for entrepreneurship. Self-efficacy was added as it is a common operationalisation of PBC. PBC was originally formulated as people's perception of the ease or difficulty of performing the behaviour involved. Formulated in this way, perceived behavioural control is compatible with Bandura's (1977; 1982) concept of perceived self-efficacy (Ajzen, 1991). Previous work using the TPB found empirical support for the relationship between entrepreneurial self-efficacy and entrepreneurial intentions (Krueger, 1993, Kolvereid, 1996b, Krueger, Reilly and Carsrud, 2000).

Hypothesis 2: Students who rate themselves higher in terms of perseverance, creativity, entrepreneurial alertness, and self-efficacy with regard to setting up a business, will take more interest in starting a business.

Subjective norms. Subjective norms are the third factor explaining intentions in the TPB, next to attitudes and perceived behavioural control. While in research using the Theory of Planned Behaviour results for subjective norms were generally mixed, in entrepreneurship research subjective norms have proven to be important (Krueger 1993; Kolvereid, 1996b). One reason for this might be that students are often in the process of finding out their career choice preferences. The opinions of parents, partners, friends and important others might be influential in this process.

Hypothesis 3: Students with more positive subjective norms toward starting one's own business will take more interest in setting up a business.

METHOD

Samples. The population that was studied were university business students. As mentioned above, pilot studies were held at the Free University of Amsterdam and at the University of Amsterdam in order to ascertain modal beliefs about attitude and PBC. In order to diminish the possibility of capitalizing on chance, the main study was conducted with other samples of undergraduate students of business administration. In order to test for the robustness of results, the study was conducted four times at four different universities. They were taken from the North (University of Groningen), the West (Erasmus University Rotterdam), the East (University of Nijmegen), and the South (University of Maastricht) of the Netherlands. Of the total sample of 1301 students, 3,8% (49 students) owned a business already. As our research design is limited to the explanation of intentions, eventual attempts at starting a business are outside the scope of this study. For this reason we excluded the students who currently own a business from the sample, plus 17 students who had not filled out this question. The remaining samples consisted of 291 (Groningen), 185 (Rotterdam), 420 (Nijmegen), and 339 (Maastricht) students, totalling 1235. All students were in the 2nd, 3rd or 4th year of their study. Average age of the sample was 22 years old, 63% were male and 37% were female.

Operationalisation of dependent variables. Table 2 gives the questions and the responses for the dependent variables. Questions 1 and 5 were taken from Davidsson (1995). Question 2 was taken from Krueger (1993). Questions 3 and 4 were taken from Brenner, Pringle and Greenhaus (1991). Questions 2, 4, and 5 can be considered behavioural expectancies. Question 2, however, is a behavioural expectancy without engagement or commitment. Question 1 concerns past interest and question 3 concerns career preference. The five variables run from rather uncommitted to specific behavioural expectancies, and can also be conceived of as a cumulative index. The figures in table 1 show that approximately about half of the samples are interested in setting up a business (similar figures were obtained in the two pilot studies). The difference in responses between question 3 and question 4 show the impact of asking about a career preference or about a behavioural expectancy. Similar figures were obtained by Brenner, Pringle and Greenhaus (1991). About three quarters of the students who would prefer to operate their own business do not expect to realise this preference. This may be less dramatic than it seems as many of

these students indicate that they want to gain more work experience first. The samples differ significantly in their level of entrepreneurial intentions on the 1st, 2nd, and 5th question, with the samples from Maastricht and Rotterdam having higher levels of entrepreneurial intentions than those from Groningen and Nijmegen.

Table 2 Frequency score on the dependent variables

shorthand	categories	groningen	rotterdam	nijmegen	maastricht
1. ever considered	no	52%	35%	49%	40%
	yes	48%	65%	51%	60%
2. ever start	no	44%	38%	48%	32%
	yes	56%	62%	52%	68%
3. free to choose	organisation	52%	46%	54%	47%
	own business	48%	54%	46%	53%
4. likely to choose	organisation	87%	85%	89%	87%
	own business	13%	15%	11%	13%
5. % chance to start in five years	(preferring own business in Q3)	23%	28%	31%	31%

Note: Question 1: Have you ever considered founding your own firm?; Question 2: Do you think you will ever start a business?; Question 3: If the opportunity presented itself, and you were free to make any employment choice you desired, would you prefer to (__ Work for an organisation; __ Operate your own business); Question 4: Realistically, however, considering your actual situation and constraints upon your options (for example, lack of money), indicate which employment opportunity you're most likely to choose (__ Work for an organisation; __ Operate your own business); Question 5: How likely do you consider it to be that within five years from now you'll be running your own firm? __% (of those preferring own business in question 3)

Operationalisation of independent variables. Table 3 gives the scale characteristics (including Cronbach's alpha's) of the explanatory variables. Whenever reliable and valid measures were available in the literature, they were used. Autonomy was measured by asking for the aspects of worker autonomy indicated by Breaugh (1999): freedom with regard to the what, how and when of work. To account for the context of self-employment two items were added concerning preference for a high level of responsibility (van Gelderen and Jansen, 2006). The importance attached to money and wealth was measured using items supplied by Mitchell and Mickel (1999) and Tang (1995). Measures for challenge, financial security and work load avoidance were derived from a domain analysis of the answers of the respondents to the open questions asked in the pilot studies. The measure of self-efficacy was taken from Kolvereid (1996b), as his measure is specific to the situation of starting a business and showed adequate reliability in his research. Entrepreneurial alertness was measured by items supplied by Busenitz (1996). Perseverance measurement is based on an adaptation for entrepreneurship of an NEO-FFI scale (Driessen, 1996). Creativity is assessed by means of a scale used in a Dutch policy study on successful entrepreneurship (Wennekes, 2001). *Subjective norms* were measured identically as in Kolvereid (1996b).

Variables making up the TPB are derived by the multiplication of beliefs and evaluations. Subjective norms were indeed derived in this manner: norms of parents, friends and important others with regard to starting a business are multiplied with the motivation to comply. Reliabilities were usually adequate but in a few cases items were deleted from the scale in order to attain this adequateness.

The attitude and PBC variables in Table 3 merely concern evaluations; the beliefs were derived from pilot studies. In order to avoid response style bias, with some respondents tending

to extreme answers and others to average answers, belief strength was given unitary value for every respondent. However, following Brenner et al. (1991), it was investigated whether conflicting perceptions (between respondents) about organisational respectively self-employment outcomes existed. The relevance of this check can be illustrated by some examples. It could be that the students preferring organisational employment believe that working for an organisation means that you can make more money, or that you have to work less hard and long than when having

Table 3 Reliabilities and descriptives

variables	sample	reliability cr. alpha	mean	sd	no. of items	range
interest in entrepreneurship (composite scale)	groningen	.76	-	.68	5	z-score
	rotterdam	.71	-	.66	5	
	nijmegen	.77	-	.70	5	
	maastricht	.75	-	.68	5	
importance of autonomy	groningen	.81	5.39	.83	5	1 - 7
	rotterdam	.82	5.51	.81	5	
	nijmegen	.63	5.51	.67	4	
	maastricht	.67	5.43	.67	5	
importance of wealth	groningen	.73	4.33	.93	6	1 - 7
	rotterdam	.76	4.42	.98	6	
	nijmegen	.78	4.18	1.02	6	
	maastricht	.77	4.38	1.05	6	
challenge	groningen	.83	5.52	.82	6	1 - 7
	rotterdam	.81	5.60	.75	6	
	nijmegen	.74	5.62	.65	6	
	maastricht	.80	5.77	.74	6	
financial security	groningen	.65	4.70	1.08	3	1 - 7
	rotterdam	.72	4.59	1.11	3	
	nijmegen	.67	4.82	1.06	3	
	maastricht	.70	4.57	1.08	3	
work load avoidance	groningen	.79	4.16	1.09	5	1 - 7
	rotterdam	.79	3.97	1.07	5	
	nijmegen	.78	4.00	1.05	5	
	maastricht	.79	3.90	1.13	5	
perseverance	groningen	.74	4.68	.84	7	1 - 7
	rotterdam	.75	5.14	.80	7	
	nijmegen	.65	5.12	.68	7	
	maastricht	.67	5.15	.75	6	
creativity	groningen	.83	5.08	.85	7	1 - 7
	rotterdam	.78	5.11	.72	7	
	nijmegen	.77	5.07	.68	7	
	maastricht	.70	5.15	.67	7	
entrepreneurial alertness	groningen	.80	4.23	1.12	5	1 - 7
	rotterdam	.80	4.44	1.09	5	
	nijmegen	.74	4.28	1.01	5	
	maastricht	.82	4.31	1.17	5	
self-efficacy	groningen	.74	4.60	.74	5	1 - 7
	rotterdam	.76	4.70	.74	5	
	nijmegen	.72	4.55	.71	5	
	maastricht	.66	4.82	.85	3	
subjective norm	groningen	.81	2.70	2.12	3	-9 - 9
	rotterdam	.81	2.83	2.32	3	
	nijmegen	.83	2.22	2.09	3	
	maastricht	.85	2.83	2.37	3	

your own business. At the same time the students who prefer self employment may believe that you can make more money being self employed, and that you can work less hard and long because you can eventually hire people to do the work for you. For this research this would mean that the variables “importance of money” and “work load” are strong predictors of entrepreneurial intentions for each respective group. Unfortunately it would not show up in our results, as the effects work in opposing directions and cancel each other out.

It was first asked on a seven point scale to which extent the participant associated a particular variable with self employment and organisational employment. Variables exclusively particular to self employment (entrepreneurial alertness and self efficacy) were not investigated as they are obviously primarily related to self employment. Then the two scores were subtracted from one another. The modal beliefs were computed per separate groups split by dependent variable 3 (the question about career choice when free of restraints). Finally, if a difference in sign would be observed, a paired sample T-test was conducted. Reporting for the sample as a whole, both groups believed that self-employment offered more autonomy, challenge, financial insecurity, and work load, and required more creativity and perseverance. However, with respect to the possibility of earning a lot of money, students preferring organisational employment believed that organisational employment would offer more possibilities in this respect ($M=4.63$ versus $M=4.92$). People preferring self employment believed that self employment was more associated with making money ($M=4.98$ versus $M=4.80$). A paired sample t-test for the mean difference (the difference between -0.29 and $.18$, totalling $.47$) proved to be statistically significant ($T=5.46$, $p<.00$). A high degree of importance attached to wealth attainment will inhibit respectively enhance entrepreneurial interest when people believe they can earn less respectively more money starting their own firm relative to working for an organisation. Therefore, an interaction term is used in the regression equations where the importance attached to money is multiplied by the level and sign of the individual’s of association of earning money with organisational employment or self-employment.

Table 4 Correlation table (total sample, N=1235)

	1	2	3	4	5	6	7	8	9	10
1. entrepreneurial intentions	—									
2. autonomy	.22	—								
3. importance of wealth	.18	-.01	—							
4. challenge	.15	.66	-.03	—						
5. financial security	-.43	-.07	-.07	-.07	—					
6. work load avoidance	-.29	-.10	.01	-.19	.48	—				
7. perseverance	.10	.39	.03	.45	-.03	-.15	—			
8. creativity	.29	.53	-.02	.62	-.16	-.17	.40	—		
9. entrepreneurial alertness	.43	.27	.05	.29	-.24	-.17	.20	.60	—	
10. self-efficacy	.33	.25	.10	.222	-.25	-.20	.14	.33	.25	—
11. subjective norm	.32	.20	.06	.17	-.17	-.15	.08	.19	.22	.33

$r > .06$ $p < .05$; $r > .08$ $p < .01$.

Because of space considerations the correlation table (Table 4) is given for the whole sample, with the subsamples showing similar patterns. All variables have significant first order correlations with interest in entrepreneurship. The table also shows a number of high intercorrelations. Within the component of attitude autonomy and challenge have a very high intercorrelation. The same

applies to entrepreneurial alertness and creativity within the component of perceived behavioural control. To ease concerns about multicollinearity, tolerance statistics did not approach zero (lowest tolerance = .74) (Tabachnick & Fidell, 2001, p.84) and variance inflation factor (VIF) indexes did not approach 10 (highest VIF = 1.57). Perusal of a histogram of standardized residuals did not lead to major concerns about marked deviations from the assumption of multivariate normality. Concerns about equality of variance were assuaged with a scatter plot of standardized predicted values plotted as a function of standardized residuals, which showed fairly random patterning in the data. Partial plots showed support for linear patterning in the data, and did not indicate evidence of homoscedasticity. However, a factor analysis (varimax rotation) of all items of the explanatory variables showed that autonomy and challenge items load on the same factor. Entrepreneurial alertness and creativity items also load on an identical factor. While empirically these variables appear to be singular constructs, theoretically they are distinct. Therefore we choose not to collapse the items into composite variables but rather to take out one variable of the regression analyses based on their predictive properties. For the whole sample as for the subsamples, when regressed on a composite of the dependent variables, autonomy has higher first and second order correlations (.22 and .12) than challenge (.15 and -.08). Entrepreneurial alertness has higher first and second order correlations (.43 and .27) than creativity (.29 and -.02). From the negative partial correlations we can gather that challenge and creativity work as a suppressor variables and were dropped from the analysis.

RESULTS

Table 5 shows the results of logistic regression analyses for the first four dependent measures and linear regression analysis for the fifth dependent measure and the composite scale. A need for financial security (as a reversed predictor) and the level of entrepreneurial alertness stand out as explaining variables. They are both significant on the 1% level in all four samples when explaining the composite index of entrepreneurial intentions (Table 5f). Of the 20 equations listed in Tables a, b, c, d, and e, both are explanatory variables on a below 1% significance level in 12 of them. Autonomy and perseverance, on the other hand, do not explain intentions below the 1% significance level in any out of the 20 equations. The remaining variables are sometimes important sometimes not, with social norms being often important when the dependent variable is relatively non-committal (Tables 5a, b, and c) and self-efficacy being often important when the dependent variable is a strict behavioural expectancy (Tables 5d and 5e). In sum, it can be stated that the hypotheses are confirmed or refuted dependent on the variable involved. Also on the sample level there is variety in the outcomes. In general stronger results are obtained for the Nijmegen and Maastricht samples, being larger. Self efficacy is a stronger influence for the Rotterdam and Nijmegen samples than for the Groningen and Maastricht samples.

DISCUSSION

This study has given further evidence for the usefulness of the TPB in explaining interest in entrepreneurship. For the composite dependent measure, the model explained between 35% and 40% of the variance in interest in entrepreneurship (Table 5f). This figure is quite comparable with previous results. Krueger, Reilly and Carsrud (2000) found the TPB to explain 35% of the variance in entrepreneurial intentions, and Tkachev and Kolvereid (1999) even explained 45%. One contribution to the literature is that we have sorted out the impact of a variety of dependent

measures. Contrary to theoretical reasoning and previous research, we found attitudinal variables to explain strict dependent measures just as perceived behavioural control variables explained noncommittal dependent measures. With regard to the importance attached to money, work load avoidance, self-efficacy, and social norms, results were unstable. This one the one hand shows that a composite measure is superior to single items dependents, and on the other hand that it is useful to investigate a range of dependent variables. The stability of results was not only ascertained by the use of different dependents but also by the use of different subsamples. Obviously the explanatory power increases with sample size, but apart from that the results show again that particularly strong or particularly insignificant relationships tend to be replicated, and that the instability of results concern the variables with a moderate relationship with intentions.

In spite of all our efforts to arrive at a sound explanation of entrepreneurial intentions the eventual adjusted r square was not higher than in previous work. Thus, the title of this paper is not reflected in the results. This may be explained by some methodological concerns that still remained. One is common method bias: dependent and independent measures were derived from the same source. Another one is that despite careful selection of the variables, this did not prevent two couples of variables to show construct overlap. A third one is restriction of range. It may well be that a variable as autonomy was insignificant in this study because it was highly valued by people preferring organisational employment as well as by those preferring self-employment. However, apart from methodological shortcomings, it is also well possible that it is very difficult to arrive at higher degrees of explanation of entrepreneurial intentions because of the characteristics of the population. As discussed above, at the average age of 22 and still in university, most people are uncertain and undecided about their career intentions.

Table 5a Logistic regression on “ever considered to start a business”

VARIABLES	groningen		rotterdam		nijmegen		maastricht		e^{β}
	B	wald	B	wald	B	wald	B	wald	
importance of autonomy	.34	2.7	.01	0.0	.26	1.7	.16	0.5	1.6
importance of wealth	.03	1.4	.06	3.0	.06	6.4*	.01	0.2	1.0
financial security	-.41	7.0**	-.49	4.6**	-.64	18.6**	.5	30.3**	.4
work load avoidance	-.39	6.8**	-.19	0.7	-.09	0.4	.9	0.5	.9
perseverance	-.27	2.0	-.18	0.4	-.01	0.0	-.07	0.1	.8
entrepreneurial alertness	.48	9.7**	.50	7.1**	.59	17.7**	.56	18.2**	1.7
self-efficacy	.44	3.8	.64	4.0*	.63	9.4**	.19	1.0	.8
subjective norm	.14	3.3	.21	4.9**	.16	6.2*	.26	16.2**	1.3
constant	-1.50	1.1	-1.15	0.3	-3.60	4.4*	2.17	1.9	
chi-square goodness-of-fit		83.8		58.1		137.4		111.9	
% correctly classified		75%		75%		74%		74%	

*p < .05. ** p < .01. e^{β} = exponentiated B (odds ratio).

Table 5b Logistic regression on “will you ever start a business”

VARIABLES	groningen		rotterdam		nijmegen		maastricht		e^{β}
	B	wald	B	wald	B	wald	B	wald	
importance of autonomy	.06	0.1	.02	0.0	-.24	1.9	.04	0.0	1.0
importance of wealth	.02	0.6	.03	0.8	.02	1.2	.03	2.3	1.0
financial security	-.23	2.5	-.16	0.7	-.38	9.2**	.7	5.4*	.7
work load avoidance	-.15	1.2	.09	0.2	-.02	0.0	-.10	0.6	.9
perseverance	-.12	0.5	-.18	0.5	.05	0.1	-.01	0.0	1.0
entrepreneurial alertness	.33	5.6*	.26	2.4	.43	12.9**	.63	24.7**	1.9
self-efficacy	.38	3.5	.38	2.0	.24	1.9	-.03	0.0	1.0
subjective norm	.11	2.6	.15	3.7	.08	1.9	.17	7.1**	1.2
constant	-1.23	0.8	-1.60	0.7	-.02	0.0	-.34	0.0	
chi-square goodness-of-fit		40.7		18.7		54.4		67.3	
% correctly classified		62%		65%		64%		72%	

*p < .05. ** p < .01. e^{β} = exponentiated B (odds ratio).

Table 5c Logistic regression on "free to choice self-employment or organisational employment"

VARIABLES	groningen		rotterdam		nijmegen		maastricht		e^{β}		
	B	wald	B	wald	B	wald	B	wald			
importance of autonomy	.31	2.6	1.4	.05	0.0	1.1	.23	1.5	1.3	0.9	1.2
importance of wealth	.05	5.7*	1.1	.04	2.2	1.0	.05	5.7*	1.1	.06	9.7**
financial security	-.37	6.3*	.7	-.74	12.3**	.5	-.54	16.5**	.6	-.73	25.2**
work load avoidance	-.09	0.4	.9	.20	0.9	1.2	-.23	3.1	.8	.04	0.1
perseverance	.21	1.5	1.2	-.21	0.6	.8	-.17	0.9	.8	-.03	0.0
entrepreneurial alertness	.33	5.5*	1.4	.23	1.7	1.3	.37	8.1**	1.4	.33	8.0**
self-efficacy	.03	0.0	1.0	.20	0.5	1.2	.24	1.7	1.3	-.23	2.1
subjective norm	.16	5.3*	1.2	.28	10.4**	1.3	.15	5.9*	1.2	.18	9.0**
constant	-2.55	3.4*	.81	.81	0.2	0.0	.01	0.0	1.2	1.61	1.2
chi-square goodness-of-fit		57.3		46.0		101.7		81.1			
% correctly classified		67%		70%		71%		67%			

*p < .05. **p < .01. e^{β} = exponentiated B (odds ratio).

Table 5d Logistic regression on "likely to choose self-employment or organisational employment"

VARIABLES	groningen		rotterdam		nijmegen		maastricht		e^{β}		
	B	wald	B	wald	B	wald	B	wald			
importance of autonomy	.62	3.0	1.9	.52	1.6	1.7	.58	3.2	1.8	.36	1.1
importance of wealth	-.00	0.0	1.0	.03	0.5	1.0	.05	2.2	1.0	.06	5.6*
financial security	-.75	10.6**	.5	-.59	4.9*	.6	-.41	4.2*	.7	-.39	3.9*
work load avoidance	-.14	0.4	.9	.46	2.6	1.6	-.63	7.5**	.5	-.23	1.6
perseverance	.44	2.6	1.6	-.20	0.3	.8	-.42	2.0	.7	.31	1.2
entrepreneurial alertness	.54	4.5*	1.7	.28	1.0	1.3	.46	5.2*	1.6	.28	2.6
self-efficacy	.64	3.4	1.9	1.18	8.8**	3.2	.73	5.6*	2.1	.17	0.5
subjective norm	.01	0.0	1.0	.08	0.5	1.1	.18	3.5	1.2	.15	3.1
constant	-9.42	13.3**	-10.3	10.2**	4.0*	5.36	-5.72	5.8*			
chi-square goodness-of-fit		67.3		32.6		80.8		42.3			
% correctly classified		91%		87%		91%		87%			

*p < .05. **p < .01. e^{β} = exponentiated B (odds ratio).

Table 5e Multiple linear regression on “%chance that you will start a business in the next 5 years”

VARIABLES	groningen		rotterdam		nijmegen		maastricht	
	beta	t	beta	t	beta	t	beta	t
importance of autonomy	.10	1.62	-.05	-.56	.08	1.82	-.01	-.21
importance of wealth	.15	2.84	-.10	-1.36	.06	1.46	.12	2.53
financial security	-.17	-2.79	-.17	-2.08	-.22	-4.41	-.20	-3.44
work load avoidance	-.02	-.30	.08	.98	-.33	-1.57	-.06	-1.04
perseverance	.05	.87	-.13	-1.54	.12	1.2	.03	.54
entrepreneurial alertness	.24	4.00	.15	2.02	.04	.29	.29	5.67
self-efficacy	.15	2.55	.36	4.60	.13	2.85	.07	1.35
subjective norm	.02	.27	.14	2.06	.08	1.76	.14	2.76
constant		-2.18		-.72		-1.09		.45
f-value		12.51		7.67		24.04		14.31
adjusted r-square		.26		.23		.31		.24

Table 5f Multiple linear regression on composite index of entrepreneurial intentions

VARIABLES	groningen		rotterdam		nijmegen		maastricht	
	beta	t	beta	t	beta	t	beta	t
importance of autonomy	.13	2.40	.03	.42	.07	1.58	.04	.87
importance of wealth	.11	2.35	.07	1.10	.11	2.86	.14	3.21
financial security	-.24	-4.29	-.29	-3.83	-.25	-5.53	-.31	-5.97
work load avoidance	-.09	-1.67	.11	1.44	-.11	-2.28	-.05	-.95
perseverance	.03	.60	-.09	-1.26	.21	1.69	.01	.18
entrepreneurial alertness	.24	4.39	.20	2.91	.00	.27	.31	6.70
self-efficacy	.13	2.37	.27	3.86	.15	3.58	-.01	-.27
subjective norm	.12	2.24	.21	3.23	.14	3.23	.21	4.53
constant		-3.33		-2.39		-2.10		-.67
f-value		20.81		13.27		35.16		26.15
adjusted r-square		.36		.35		.40		.38

Our sample consisted of students, which makes the knowledge that we have gained relevant for entrepreneurship education. The dependent variables show that the degree of interest that students take in entrepreneurship is quite high. The large number of people preferring self employment when free to choose, while preferring organisational employment when considering actual restraints, suggest that there is room for entrepreneurship education to have an impact. Our results provide clues on how to narrow this gap. It points out the variables that have the strongest association with entrepreneurial interest. The variables with the best explanatory power were entrepreneurial alertness, and the importance attached to financial security. Entrepreneurial alertness can be trained by having students exercise skills as business idea generation exercises (e.g., Fiet, 2002; DeTienne and Chandler, 2004; van Gelderen, 2004). Our research can not establish the direction of causality, but the correlation suggests that the possession of an idea for a business has motivating properties. This may be explained by psychological investment principles: getting ideas about business opportunities creates interest in realising these ideas. Financial security is a reversed predictor for entrepreneurial interest. This suggests that entrepreneurial interest is not encouraged by the love of risk but rather discouraged by the fear of financial insecurity. Financial security can perhaps best be targeted at the belief level. At the belief level, the association of financial insecurity with self-employment can be reduced by teaching students strategies that reduce risk. Increasing self-efficacy with regard to self-employment should reduce the expectation that self-employment will inevitably mean financial insecurity.

Future research should examine the relation between entrepreneurial interest/intentions and eventual behaviour, possibly with other samples than of students of business administration. In spite of being limited in our approach, we believe that our effort to provide explanations of entrepreneurial interest on the variable level is worthwhile. Knowledge of this kind is indispensable when designing education interventions and enabling practices.

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